

## ABSTRACT OF THE DISCLOSURE

**[78]** A method for processing an accelerometer data set generated from an operating internal combustion engine is disclosed. The processed accelerometer data is cepstrally filtered and a heat release trace is pulled from the accelerometer data set. That heat release trace is then used to estimate combustion quality and combustion phasing within the engine and control future combustion events using this information. Misfire and knock sensing is also incorporated into the engine controls. The method provides controls for an engine to allow it to adjust combustion from cycle window to cycle window generally without the need for expensive and less durable direct pressure measurement devices as compared to accelerometers. The resulting fuel injection speed results in the fuel passing through shock waves within the combustion chamber, which, in turn, promotes combustion of the fuel by promoting mixing of the fuel and intake charge within the combustion chamber.